

REMARKS

In item 2 on page 2 of the September 30, 2005 Office Action, claim 1 was rejected under 35 USC § 102(b) as anticipated by U.S. Patent Application Publication 2003/0175036 A1 by Mamyshev (herein referred to as "Mamyshev '036").

Claim 1 recites "an optical pulse generating unit generating an optical pulse by generating modulation spectrum components by performing phase modulation for light from said light source, and by adjusting phases of wavelengths of the modulation spectrum components included in generated light" (claim 1, lines 4-7). On the other hand, what was cited in Mamyshev '036 states that a

continuous-wave (CW) optical signal from a laser ... is modulated by the NRZ data signal in the phase modulator 10, and the phase-modulated signal is provided to a Mach-Zehnder interferometer 12 ... A portion of the output optical signal is tapped by an optical tap 14. This portion is converted to an electrical signal ... and the electrical signal is used ... to generate bias for the interferometer 12 ... the output of the interferometer has a phase-shaped binary transmission (PSBT) format

(paragraph [0039] and FIG. 1). In other words, a Mach-Zehnder interferometer generates a pulse by demultiplexing a plurality of lights, which are different by the length of their optical paths. Therefore, the present invention differs from Mamyshev '036 in that it generates an optical pulse by generating modulation spectrum components in contrast to demultiplexing a plurality of lights as described in Mamyshev '036. Thus, what was cited in Mamyshev '036 does not teach or suggest each element of claim 1.

In item 3 spanning pages 2-3 of the Office Action, claim 1 was rejected under 35 USC § 102(b) as anticipated by U.S. Patent Application Publication 2003/0147116 by Shpantzer. What was cited in Shpantzer states that a pulse "generator 700 includes an input modulator 710, an asymmetric MZ interferometer (AMZI) [Asymmetric Mach-Zehnder Interferometer] 720, phase shifter 730 and an AMZI 740" (paragraph [0049]). "The modulator 710 can be ... a ... MZ modulator" (paragraph [0050]). "The signal output from the modulator 710 is provided to AMZI 720, which acts as a demultiplexer" (paragraph [0051]). "Phase shifter 730 ... can introduce a desired chirp into the light" (paragraph [0052 and 0055]). "AMZI ... acts as a demultiplexer to separate the light" (paragraph [0053] and [0054]). "AMZI 820 is used twice: once to split the light into waveguides 832 and 834, and once again to combine light" (paragraph [0056]) and "Pulse generator 900 includes AMZI 920" (paragraph [0057]).

Thus, in Shpantzer the Mach-Zehnder interferometer generates a pulse by demultiplexing a plurality of lights, as in Mamyshev '036. Therefore, the same difference between the present invention and Mamyshev '036 applies to Shpantzer. Therefore, what was cited in Shpantzer does not teach or suggest each element of claim 1.

In item 4 on page 3 of the Office Action, claim 2 was rejected under 35 USC § 102(b) as anticipated by U.S. Patent No.5,473,458 to Mamyshev (herein referred to as "Mamyshev '458").

Claim 2 recites: " an optical pulse generating unit generating an optical pulse by performing phase modulation for light output from said light source" (claim 2, lines 3-4). In other words, in the present invention, the light source feeds directly into the phase modulator.

In comparison, what was cited in Mamyshev '458 was that "FIG. 1 shows ... [the] optical apparatus includes laser 2, intensity modulator 3 ... [and] phase modulator" (column 2, lines 20-26). In other words, Mamyshev '458 describes the light source feeding directly into an intensity modulator, then the output of the intensity modulator is fed into the phase modulator. Therefore, the difference between the present invention and Mamyshev '458 is that no pre-processing or preconditioning of the light is required. The present invention generates a pulse by phase modulation alone in contrast to Mamyshev '458 which discloses an intensity modulator configured before the phase modulator to pre-process the output of the light source. The intensity modulator in Mamyshev '458 is an indispensable additional component. Thus, claim 2 is not clearly anticipated by Mamyshev '458, because what was cited in Mamyshev 458 does not teach or suggest each element of claim 2.

In item 5 on page 3 of the Office Action, claim 2 was rejected under 35 USC § 102(b) as anticipated by U.S. Patent Application Publication 2003/0189745 by Kikuchi.

Claim 2 recites,

an optical pulse generating unit generating an optical pulse by performing phase modulation for light output from said light source, and by selecting, with a wavelength selector, wavelength components phases of which are aligned among the modulation spectrum components included in the generated light, and which are different from said light source

(claim 2, lines 3-6). In other words, the present invention generates an optical pulse by generating modulation spectrum components by performing phase modulation for the light output from the light source, and by selecting, wavelength components phases which are aligned among the modulation spectrum components included in the generated light, and which are different from the light source.

What was cited in Kikuchi states that "FIG. 1 ... shows ... a laser source 100 is entered into a dual-arm drive Mach-Zehnder optical modulator 101 ... DC bias ... is applied to ... invoke intensity modulation ... As a result, the laser light is converted to an intensity-modulated ... (SSB) periodic optical pulse train" (paragraph [0050]). In other words, Kikuchi discloses a Mach-Zehnder interferometer which generates a pulse by demultiplexing a plurality of lights. Therefore, the difference is that the present invention generates an optical pulse by generating modulation spectrum components and by selecting, wavelength components phases of which are aligned among the modulation spectrum components included in the generated light in contrast to demultiplexing a plurality of lights as described in Kikuchi. Thus, what was cited in Kikuchi does not teach or suggest each element of claim 2.

CONCLUSION

It is submitted that the applied art references do not teach or suggest the features of the claimed invention. Thus, it is submitted that claims 1 and 2 are in condition for allowance.

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Finally, if there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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